Sound Collaboration: the design and implementation of an online phonetics course

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Purpose of the talk

- to demonstrate that an academic discipline with sparse online presence can indeed be distance-taught

- to describe such an endeavor with a focus on collaborative peer-to-peer learning

- to report on the incorporation of specific fully-accessible online tools to enhance student success
The challenges

Most language learning programs have integrated pronunciation instruction in their curriculum.

Many teachers find teaching pronunciation difficult for a number of reasons.

Phonetic training is considered necessary.
The goals of any phonetic training in language teacher preparation:

- Provides the necessary knowledge to understand how speech sounds are made
- Teaches how to best convey this knowledge to their own language-learning students
- Trains how to diagnose and predict various pronunciation problems and develop intervention plans to address them
The challenge in designing an online phonetics course

A phonetics course in the TESL program needs to focus on **pedagogical** aspects and methodology of teaching pronunciation in addition to the **theoretical** and descriptive knowledge.

It needs to take into consideration the non-native English-speaking international students whose goal is to teach ESL in their home countries.

It needs to ensure a high level of students’ engagement, interaction, and extensive practice.
OLC Quality Framework: Five Pillars of Quality Online Education

LEARNING  FACULTY  STUDENTS  SCALE  ACCESS
The Learning Effectiveness Pillar

Effective Practices:

- Course Design
- Learning Resources
- Faculty Development
- Learner Characteristics
- Pedagogy
- Interaction (e.g., with content, faculty, other students; development of learning communities etc)
- Assessment
- Learning Outcomes (e.g. student satisfaction, retention, achievement, performance, etc)
Online Interaction in Active Learning

• According to the 2017 New Media Consortium Horizon Report, more leaders across the globe emphasize student active learning to advance cultures of innovation.

• Interaction: “an event that takes place between a learner and learner’s environment and its purpose is to respond to the learner in a way intended to change his or her behavior toward an educational goal” (Wagner, 2005, p. 9)
Interaction has become an important component to promote meaningful learning in online courses (Becker et al., 2017).
<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students work on realistic scenarios</td>
<td>Students work on realistic scenarios to apply content (e.g., case studies, reports, research papers, presentations, client projects)</td>
</tr>
<tr>
<td>Discussions are structured with guiding questions and/or prompts</td>
<td>Discussions are structured with guiding questions and/or prompts to deepen their understanding of the content</td>
</tr>
<tr>
<td>Students interact with content in more than one format</td>
<td>Students interact with content in more than one format (e.g., text, video, audio, interactive games or simulations)</td>
</tr>
<tr>
<td>Students use optional online resources to explore topics in more depth</td>
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</tr>
<tr>
<td>Students have an opportunity to reflect on important elements of the course</td>
<td>Students have an opportunity to reflect on important elements of the course (e.g., use of communication tools, their learning, team projects, and community)</td>
</tr>
</tbody>
</table>
**Instructor-Learner Interaction**
Types of active learning in online courses students reported as engaging (Bolliger & Martin, 2018):

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="https://via.placeholder.com/20" alt="bell" /></td>
<td>Sends/posts regular announcements or email reminders</td>
</tr>
<tr>
<td><img src="https://via.placeholder.com/20" alt="chart" /></td>
<td>Posts grading rubrics for all assignments</td>
</tr>
<tr>
<td><img src="https://via.placeholder.com/20" alt="computer" /></td>
<td>Students interact with content in more than one format (e.g., text, video, audio, interactive games or simulations)</td>
</tr>
<tr>
<td><img src="https://via.placeholder.com/20" alt="person" /></td>
<td>Creates a forum for students to contact the instructor with questions about the course</td>
</tr>
<tr>
<td><img src="https://via.placeholder.com/20" alt="calendar" /></td>
<td>Posts a “due date checklist” at the end of each instructional unit</td>
</tr>
<tr>
<td><img src="https://via.placeholder.com/20" alt="people" /></td>
<td>Refers to students by names in discussion forums</td>
</tr>
<tr>
<td><img src="https://via.placeholder.com/20" alt="person" /></td>
<td>Creates a course orientation for students</td>
</tr>
</tbody>
</table>
Learner-Learner Interaction
Types of active learning in online courses students reported as engaging: (Bolliger & Martin (2018))

- Introduce themselves using an ice-breaker discussion
- Work collaboratively using online communication tools to complete case studies, projects, reports, etc.
- Interact with peers through student presentations (asynchronously and synchronously)
- Have choices in the selection of readings (articles, books) that drive discussion group formation
- Peer review classmates’ work
What is phonetics?
The study of human speech sounds

**ARTICULATORY**—HOW THE SOUNDS ARE MADE IN THE MOUTH

**ACOUSTIC**—HOW THE SOUNDS ARE MEASURED

**PHONETIC TRANSCRIPTION**—HOW SOUNDS ARE REPRESENTED WITH SYMBOLS
English word “pin”

- Articulatory

- Acoustic

- Phonetic transcription \([pʰɪn]\)
Phonetics and ESL

Since English language teachers must impart the knowledge of English into the minds of second language learners, and since phonetic knowledge is part of English, then teachers need to explicitly train these learners.
Teaching phonetics: goals

**Theoretical knowledge**
- Description and analysis of native English sounds
- Sources of pronunciation problems in the second language

**Applied knowledge**
- Learning to phonetically transcribe speech
- Issues in the teaching and learning of these sounds for non-natives
- Analysis of non-native English speakers (analyze, diagnose, intervene)
How to best teach phonetics

- Train teachers to be close listeners through exposure to lots of accents (benefits of familiarity)
- Use IPA with speech transcription
- Ensure a collaborative and introspective enterprise
The speech accent archive
accent.gmu.edu

an open annotated collection of accent contributions

• 2,933 samples of accented English—both native and nonnative
• 265 native languages
• 1,523 cities
• 181 countries

students in the class participate in a semester-long project utilizing and contributing to the archive
Archive architecture: components

- Elicitation paragraph
- Audio sample
- Demographic information
- Maps
- Phonetic transcription
- Phonological speech patterns (PSP)
- Segment inventories
- Remote submission
- Search facility
LING 523: English Phonetics: The assignment (prelude to class project)

- **Record**: Record a non-native speaker
- **Transcribe**: Transcribe the non-native speech sample
- **Analyze**: Analyze the speech
  - Transcription
  - Generalization
- **Compare**: Compare it to a native speaker
- **Diagnose**: Diagnose problems
  - Intervention
How to do this online

The collaborative assignment - this is a major aspect of the class!

Student interaction
Feedback

There is a product!

The wiki
Please call Stella. Ask her to bring these things with her from the store: Six spoons of fresh snow peas, five thick slabs of blue cheese, and maybe a snack for her brother Bob. We also need a small plastic snake and a big toy frog for the kids. She can scoop these things into three red bags, and we will go meet her Wednesday at the train station.
LING 523: Goal: transcribe the sample and reach consensus

A phonetic transcription is an *analysis* of speech

It draws upon a listener’s perceptual and linguistic knowledge

It is more of an art, than a science

Typically utilizes multiple human listeners
how to reach consensus online?

wiki  Discussion board
Simply click on the "Create Wiki Page" button to start the process.
**LING 523: The wiki: week 6**

<table>
<thead>
<tr>
<th>your name</th>
<th>transcription: <strong>please call stella. ask her to bring these things with her from the store.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Student 1</td>
<td>pllɪːs kəl stɛlbər əsk həɹ tu ˈbɪŋ diːz θɪŋz wɪθ həɹ fɪm wɪl ˈdə stɔɹ.</td>
</tr>
<tr>
<td>Student 2</td>
<td>pʰliːz kol stɛlər əsk ʰəɹ tu ˈbɪŋ diːz θɪŋz wɪθ həɹ fɪm wɪl ˈdə stɔɹ</td>
</tr>
<tr>
<td>Student 3</td>
<td>[plɪs kəlˈtəːl əskə həɹ tʰu ˈbɪŋ ðiːs θɪŋz wɪθ həɹ fɪm wɪl ˈdə stɔɹ]</td>
</tr>
<tr>
<td>Student 4</td>
<td>[pʰəˈliːs kəɾˈtəːl əskə həɹ tʰu ˈbɪŋ ðiːs θɪŋz wɪθ həɹ fɪm wɪl ˈdə stɔɹ]</td>
</tr>
<tr>
<td>Student 5</td>
<td>[pʰliːs kəlˈtəːl əskə həɹ tʰu ˈbɪŋ ðiːs θɪŋz wɪθ həɹ fɪm wɪl ˈdə stɔɹ]</td>
</tr>
<tr>
<td>Student 6</td>
<td>[pʰəˈliːs kəˈtəːl əskə həɹ tʰu ˈbɪŋ ðiːs θɪŋz wɪθ həɹ fɪm wɪl ˈdə stɔɹ]</td>
</tr>
</tbody>
</table>

**consensus:** pʰəliːs kʰə stɛlər əskə həɹ tu ˈbɪŋ ðiːs θɪŋz wɪθ həɹ fɪm wɪl ˈdə stɔɹ
**LING 523: The wiki: week 7**

<table>
<thead>
<tr>
<th>your name</th>
<th>transcription: six spoons of fresh snow peas, five thick slabs of blue cheese, and maybe a snack for her brother bob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student 1</td>
<td>[siks spūːms ʊf fɾɛʃ sno ɪf fʌr ŋɪkʰ ˈslæps əf bɹu ɾɪʃ əm mɛbi ə snækʰ fɔː hə ɜː bʌdʒɪŋ bɒb].</td>
</tr>
<tr>
<td>Student 4</td>
<td>[siks spʊːnz ʊf fɾɛʃ sno ɪf fər ŋɪkʰ ˈslæps əf bɹu ɾɪʃ əm mɛbi æ snækʰ fɔː hə ɜː bʌdʒɪŋ bɜɪp].</td>
</tr>
<tr>
<td>Student 1</td>
<td>[ siks pʊ̞ːns ʊf fɾɛʃ sno: ɪf fər ŋɪk ˈslæps æv bʰu ɾɪʃ əm mɛbi ə snækʰ fɔː hə bʰʌdʒɪŋ bæp]</td>
</tr>
<tr>
<td>Student 5</td>
<td>[sik spūːms ʊf fɾɛʃ sno: ɪf fər ŋɪk ˈslæps æv bʰu ɾɪʃ əm mɛbi ə snækʰ fɔː hə ɜː bʌdʒɪŋ bæp]</td>
</tr>
<tr>
<td>Student 3</td>
<td>[siks pʷʊːns əv fɾɛʃ sniwʊ us ɪf fər ŋɪkʰ ˈslæps əv n ɾɪʃ əm mɪbɨ ə snækʰ fɔː hə bʰʌdʒɪŋ bæp]</td>
</tr>
<tr>
<td>Student 6</td>
<td>[siks buːns əv fɾɛʃ sno ɪf rɨr ŋɪk ˈslæps əf nu bɾu ɾɪʃ əm mɛbi ə snækʰ fɔː hə ɜː bʌdʒɪŋ bæp]</td>
</tr>
<tr>
<td>Consensus</td>
<td>[siks spʊ̞ːns ʊf fɾɛʃ sno ɪf fər ŋɪk ˈslæps əv ɾɪʃ əm mɛbi a snæk fɔː hə ɜː bʌdʒɪŋ bæp]</td>
</tr>
</tbody>
</table>
### LING 523: The wiki: week 8

<table>
<thead>
<tr>
<th>your name</th>
<th>transcription: <strong>we also need a small plastic snake and a big toy frog for the kids</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Student 1</td>
<td>[wə əlsə niː ə smɔːl plæstɪkˈ sneɪk ən ə ˈbɪk tər ˈfɾɔɡ fər ˈθə kɪdz]</td>
</tr>
<tr>
<td>Student 3</td>
<td>[wə ˈəlsə niː ə smɔːlɪˈ plæstɪk sneɪk æn ə ˈbɪg ˈtʰɪər ˈfɾɔɡ fər ˈðə kɪdz]</td>
</tr>
<tr>
<td>Student 4</td>
<td>[wə əʊsə niː æ smoʊ plæstɪk sneɪkʰ æn ə ˈbɪg tər ˈfʁɔɡ fɔr ˈðə kɪdz]</td>
</tr>
<tr>
<td>Student 5</td>
<td>[wə əlsə niː ə sməl plæstɪk sneɪkɫ æn ə ˈbɪg ˈtʰɪər ˈfɾɔɡ fɔr ˈðə kɪdz]</td>
</tr>
<tr>
<td>Student 2</td>
<td>[wi əsə niː ə smɔːl ˈplæstɪk ˈsneɪk æn ə ˈbɪg ˈtʰɪər ˈfɾɔɡ fɔr ˈðə kɛdʒ]</td>
</tr>
<tr>
<td>Student 6</td>
<td>[wə əlsə niː ə smɔː plæstɪk sneɪk æn ə ˈbɪg ˈtʰɪər ˈfɾɔɡ fɔr ˈðə kɪdz]</td>
</tr>
<tr>
<td>Consensus</td>
<td>[wə əlsə niː ə smoː plæstɪk sneɪk ðə ə ˈbɪk tʰɪər ˈfɾɔɡ fɔr ˈðə kɪdz]</td>
</tr>
</tbody>
</table>
your name | transcription: **she can scoop these things into three red bags, and we will go meet her Wednesday at the train station.**
--- | ---
Student 3 | [ʃi kæn skɔp əθi ər bæks ən wi wiː go miː həɾ ˈwɛnsdəi ət də ʧreɪn ˈsteɪʃn] 
Student 4 | [ʃi kɛn skɔupʰ əθi ər bæks əm wi wiː goʊ miː həɾ ˈwɛnsdəi ət ˈdə ˈtɹeɪn ˈsteɪʃn] 
Student 1 | [ʃi kæns kɔp əθi ər bæks ənwiː ɡo miː həɾ wənsdəi ət ˈtær ˈtɹeɪn ˈsteɪʃn] 
Student 6 | [ʃi kæn skɔupʰ əθi ər bæks əm wu wiː goʊ miː həɾ wənsdəi ət ˈdə ˈtɹeɪn ˈsteɪʃn] 
Student 2 | [ʃi kæn skɔupʰ əθi ər bæks ən wi wiː goʊ miː həɾ wənsdəi ət ˈdə ˈtɹeɪn ˈstæʃn] 
Student 5 | [ʃi Kæn skɔp əθi ər bæks ən wi wiː goʊ miː həɾ wənsdəi ət ˈtʃuɪn ˈsteɪʃn] 
Consensus | [ʃi kæn skɔupʰ əθi ər bæks ən wi wiː go miː həɾ wənsdəi ət ˈdə ˈtʃuɪn ˈsteɪʃn]
“D: This week I really struggled with the coronal consonants of this speaker. It is a d, t, θ, or ð? I really did not think that I hear a true interdental fricative at all. So I tended to transcribe a dentalized [t]. No one else did this (at the time I posted) so I have yet to see anyone agreeing with this interpretation.”

“A: According to the last week transcription, I feel very pleased that our transcriptions have been improved. In overall, there is a kind of disagreement that is noticeable in our transcriptions. That is, no one got the glottal stop in “need”. In addition, no one got the transcription of [a] as a corresponding sound in “a small”. The /k/ and /g/, /s/ and /z/ in finial positions were very confusing for most of us. Moreover, I think I heard /l/ in “small” and it was completely unexpected no to find it in consensus.”

“B: I think that slowly but surely we are learning more and more about transcribing a native mandarin speaker, and that each week our transcriptions do improve due to that incremental knowledge. I think the ‘aha’ moments where we become aware of a devoiced segment, or are shocked by a glottal stop, are what help push us forward. We don’t know what to pay attention to yet, what we’re looking for, and because of that we see what we expect to see. I still find this a near-maddening process, but I’m beginning to appreciate it much more.”
LING 523: Final transcription: Mandarin28
What makes the online aspect unique?

Access  Type of student  Interaction
The technology

- Blackboard (Wiki, discussion board, ask professor, homework collaboration, group projects)
- Praat, Audacity
- Smart phones
- Microphones
- Software
- Crowdsourcing application???
Outcomes (to be continued)

The F-2-F analogue showed student progress

- 10.3% improvement on transcription accuracy overall
- 8.5% improvement on group without crowdsourcing tutorial
- 12.5% improvement on group with crowdsourcing tutorial

This sets the expectations for the fully online class
Residual problems

Bb wiki must be made more specialized
users should not have to leave page for audio and discussion

Need to develop a no-contact method of recording informants

Need to expand the crowdsource transcription tutorial
Reflective session

• Listen to some accented English
• Focus on these words:
• What do you notice?
Questions
references